Date: Mon, 24 May 1999 09:49:00 -0600
From: Meredith Brown <racer@lanl.gov>
Subject: Yellow Alert: Malfunctioning Respirators

TITLE: Malfunctioning Powered Air Purifying Respirators

IDENTIFIER: KH-99-057.CA DATE: May 18, 1999

LESSONS LEARNED: Sites should evaluate their MSA OptimAir 6A PAPRs to determine if units are malfunctioning. If the blower motor modules exhibit excessive noise and/or vibration or vary in blower speed, these units should be identified, segregated out, and further evaluated.

DESCRIPTION: On March 30, 1999, ten new MSA OptimAir 6A (blower mounted on hip) Powered Air Purifying Respirators (PAPR) malfunctioned during maintenance work in Building 371. The malfunctions included variations of excessive vibration, variable fan speeds, excessive noise, and complete shut down (in 2 cases) of PAPRs. This was the first time these units were used in the field. Each unit passed required flow and battery checks before being issued to workers. The site laundry immediately stopped issuing these respirators at the request of the site Respiratory Protection Program Administrator (RPPA) pending further evaluation. The site continues to use MSA OptimAir Mask Mounted (MM) PAPRs.

ANALYSIS: The site RPPA conducted a random evaluation of 37 new OptimAir 6A PAPR's motor blowers. The RPPA identified that approximately 40% of the motor blowers evaluated had excessive vibration and/or varied flow rates. Based on this evaluation, Rocky Flats laundry personnel sent 21 malfunctioning OptimAir 6A motor blower modules to MSA for evaluation. MSA evaluated five of the OptimAir 6A motor blower modules. On April 22, 1999, MSA issued a letter to the Site RPPA identifying the problem as "the low flow and noise was caused by a loose impeller and that the impeller in each unit had loosened from the motor shaft causing the low flow." In addition, MSA stated that "once loose, the impeller would have a tendency to slide along the motor shaft and rub against the blower housing creating the noise you noticed." MSA stated that 18 of the 21 units returned to MSA were manufactured in March 1998. Through further investigation, MSA determined that the loose impeller was due to "improper adhesives used in the assembly of the impeller to the motor shaft during that time (March 1998) may not have been stored at the proper temperature and may have exceeded the expiration date." MSA indicated that the defective units will be replaced under warranty but MSA did not believe that a safety notice to users was warranted. Rocky Flats is currently evaluating options with the remaining units that they have on site.

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DOE FUNCTIONAL CATEGORY: Radiological Protection
KEYWORDS: respirator, blower, vibration, noise

FOLLOW-UP ACTIONS: Information in this report is accurate to the best of our knowledge. As a means of measuring the effectiveness of this report, please notify the contact of any action taken as a result of this report or of any technical inaccuracies you find. Your feedback is appreciated.